

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Motor Vehicle Washing Plant

I, ROBERTO EMANUEL, an Italian citizen, of 7, Via Canova, Turin, Italy, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to motor vehicle washing plants more particularly of the type employing a washing tunnel into which the vehicle may be introduced and spray nozzles therein adapted to be fed with pressure water.

In constructions known heretofore the spray nozzles are oscillatable by means of elaborate mechanisms comprising levers and eccentrics which, besides being expensive, are difficult in upkeep.

An object of this invention is to provide an improved washing plant which is inexpensive and which is reduced in size with respect to known plants.

According to this invention, in a washing plant of the above type, the nozzles are carried by tubular annuli mounted for rotation within the tunnel. Alternatively the tunnel may be replaced by two side walls carrying the rotating nozzles.

The tubular annuli carrying the nozzles may be rotated by reaction under the action of the water issuing from the nozzles. Water may be supplied to the tubular annulus through radial conduits leading from a central hub connected to a pressure water supply line. Each tubular annulus, radial conduits and hub may be connected together to form a wheel.

The relative translational movement of the vehicle and nozzles may be carried out according to this invention by either displacing the vehicle within the tunnel, or displacing the rotating nozzles along the tunnel axis while the vehicle is stationary. The latter solution considerably simplifies the plant in construction, eliminating elaborate conveyers employed heretofore for displacing the vehicle.

The nozzles may be rotated from the outside by mechanical means, instead of directly by effect of the reaction due to

delivery of water under pressure by the nozzles themselves.

When the nozzles are arranged along a circular annulus, tubular in section to which pressure water is fed by radial conduits leading to a central support to which pressure water is fed, further nozzles may be provided, for instance for washing the lower portion of the vehicle, on the radial conduits of the rotating annulus arranged in a horizontal plane situated underneath guides for the vehicle wheels.

The rotating members carrying the nozzles may be arranged in horizontal planes above and underneath the vehicle, or in vertical planes at the side walls of the tunnel, or both.

When arranged in vertical side planes, the rotating nozzles may be conveniently supported by slides moving along the tunnel axis in order to wash vehicles standing in the tunnel. The slides may be displaced mechanically or by hand.

The invention is illustrated by way of example in the accompanying drawings which show diagrammatically some embodiments thereof and in which:—

Figure 1 is a cross section of a washing plant according to this invention;

Figure 2 is a cross section on line II—II of Figure 1;

Figure 3 is a longitudinal section of the plant according to Figures 1 and 2;

Figure 4 is a longitudinal section of a further embodiment;

Figure 5 is a section on line V—V of Figure 4;

Figure 6 is a longitudinal section of a third embodiment of the invention;

Figure 7 is a plan view; and

Figure 8 is a cross section of Figure 6.

Referring to the example shown in Figures 1 to 3, 1 denotes the washing tunnel carrying a U-section guide 2 for two wheels of a motor car A, of which the other two wheels rest on a plane 3. The displacement of the vehicle A within the tunnel is effected by means of a chain 100

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conveyor 4, which is connected to a part of the car frame.

The central portion of the bottom of the tunnel 1 is provided with a conduit 5 for discharging water and a projection 6 in which a support 7 is rotatably mounted, and fed with pressure water through a conduit 8. The support 7 is connected by means of radial conduits 9 to a circular annulus 10, provided along its periphery with nozzles 11 for delivery of pressure water. The arrangement of the nozzles is such as to rotate the annulus 10 by reaction.

Vertical conduits 12 are branched from the radial conduits 9 and lead to nozzles 13 adapted to wash the lower car part.

The ceiling of the tunnel 1 is provided at its central part with a depending support 14 in which a hub 15 is rotatably mounted and is fed with pressure water by a conduit 16. The hub 15 is connected by means of radial conduits 17 to a tubular annulus 18 provided with nozzles 18a adapted to wash the roof and side car walls and arranged to rotate automatically the annulus by reaction.

The two above described devices are sufficient for thoroughly washing the car when it is moved within the tunnel 1 by means of the conveyor 4. However, when a quicker and more efficient washing of the vehicle is desired, further nozzles of a similar type may be fitted to the side walls of the tunnel. The right-hand part of Figures 1 and 2 shows by way of example a support 19 in which a hub 20 is rotatable and fed through a conduit 21 with pressure water, and from which spokes 22 lead to an annulus 23 provided with nozzles 23a for the delivery of pressure water and simultaneous rotation of the annulus.

In the example shown in Figures 4 and 5, two slides 26 are movable at the side walls of the tunnel 1 and are provided with supporting and guiding wheels 27.

Each of the slides supports a hub 28 rotating about a horizontal axis and fed with pressure water through a hose, not shown.

Radial conduits are branched from the hub and lead to an annulus 28a carrying the washing jets adapted at the same time to rotate the annulus.

The radial conduits are provided, as in the previous examples, with a further set of nozzles. In this case, the relative axial displacement between the nozzles and car is obtained by displacing the slides 26. For this purpose, each slide is provided with a nut 29 engaging a screw 30 which is rotated through a pair of bevel gears 31 by a handwheel 32.

In the lower portion of Figure 5, the

screw 30 is rotated by means of a belt drive 33 from an electric motor 34.

It will be understood that the slides 26 might be displaced by any other device, such as conveying chains or cables actuated either by hand or mechanically.

This construction considerably reduces the device in length by eliminating the conveyor for the car.

Referring to the embodiment shown in Figures 6, 7 and 8, 35 denotes a tunnel section of reduced length, equalling approximately one half a car length.

This tunnel section is mounted for longitudinal displacement by means of 80 wheels 36 movable in longitudinal stationary guides 37.

The tunnel section 35 is moved by means of an endless belt 39 connected to said tunnel element by means of an adapter 38. The cable winds on end pulleys 40, 41 and is rotated by means of a crank 42. The two side walls of the tunnel section 35 carry on the inside two rotating spraying nozzles 43 of the above described type, fed with pressure water through hoses 44.

A third rotating spraying nozzle 45, arranged in the horizontal plane underneath the car in the space confined between the car wheels is carried by a stiff metal tube 46 which is bent to form an elbow and is connected to the movable tunnel 35.

The spraying nozzle 45 is supported by means of wheels 47 movable in a longitudinal guide 48.

In this case also, the car is washed while standing by displacing the tunnel section together with the spraying nozzles. At the end of the washing operation, the car is moved back outside the tunnel. The tunnel element 35 may be moved by means of an electric motor or other means. When a very simple construction is desired, the tunnel may be replaced by two side walls carrying the rotating nozzles and adapted to prevent water sprays outside the plant.

What I claim is:—

1. Motor vehicle washing plant, comprising a washing tunnel into which the vehicle may be introduced and spray nozzles arranged in said tunnel and adapted to be fed with pressure water, wherein the nozzles are carried by tubular annuli rotatably mounted within the tunnel.

2. Motor vehicle washing plant, as claimed in Claim 1, wherein the tubular annuli are rotated by reaction under the action of the water issuing from the nozzles, the pressure water being supplied to each tubular annulus through radial conduits leading from a central hub connected to the pressure water

supply line, the annulus, radial conduits and hub being connected together in wheel form.

3. Motor vehicle washing plant, as claimed in Claim 2, wherein the tubular wheels carrying the nozzles are rotatably mounted on the sides, ceiling and floor of the tunnel, two guides being further mounted on the tunnel floor for displacement of the vehicle within the tunnel.

4. Motor vehicle washing plant as claimed in Claim 3, wherein one of the guides is flat, while the other is of U-shaped section, an endless chain conveyor being provided between the said guides and fitted with means for engaging the vehicle, in order to move the latter along the tunnel for receiving water jets throughout.

5. Motor vehicle washing plant as claimed in Claim 3 or 4, wherein the tubular wheel mounted for rotation on the tunnel floor carries nozzles branched from the radial conduits, in order to wash efficiently the lower vehicle side.

6. Motor vehicle washing plant as claimed in Claim 1 or 2, wherein the tubular annuli carrying the nozzles are mounted for rotation on carriages movable along the tunnel sides, the said carriages being moved along the tunnel by means of a hand-actuated or motor driven screw control, the vehicle being held stationary

within the tunnel during washing.

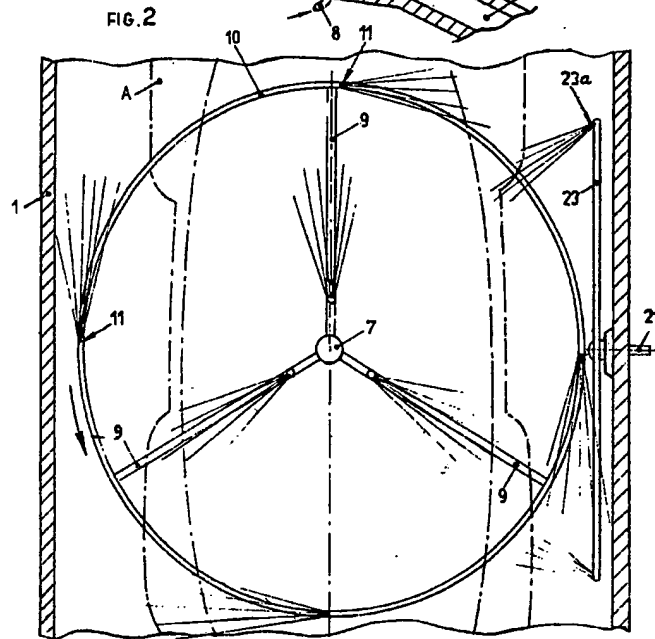
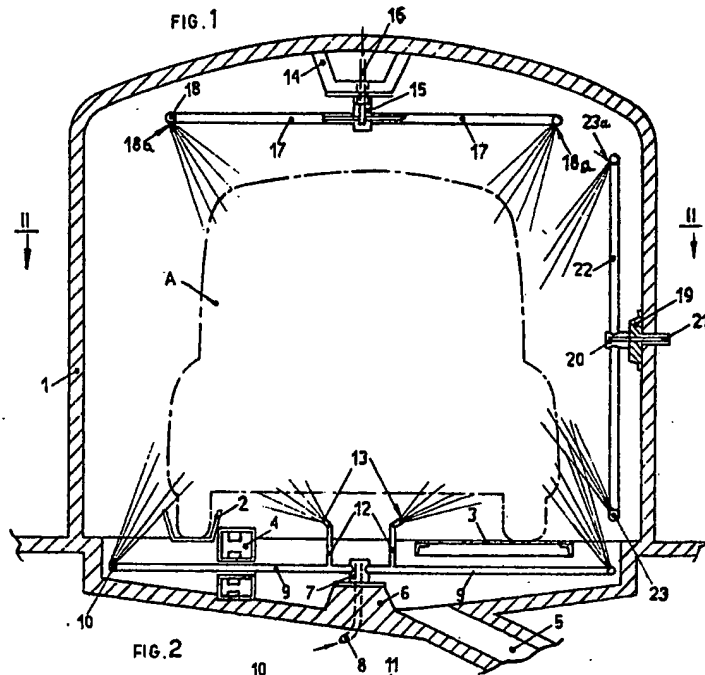
7. Motor vehicle washing plant as claimed in Claim 1 or 2, wherein the tubular annuli carrying the nozzles are mounted in a tunnel longitudinally movable on guides, an endless conveyor being provided for moving the tunnel along said guides.

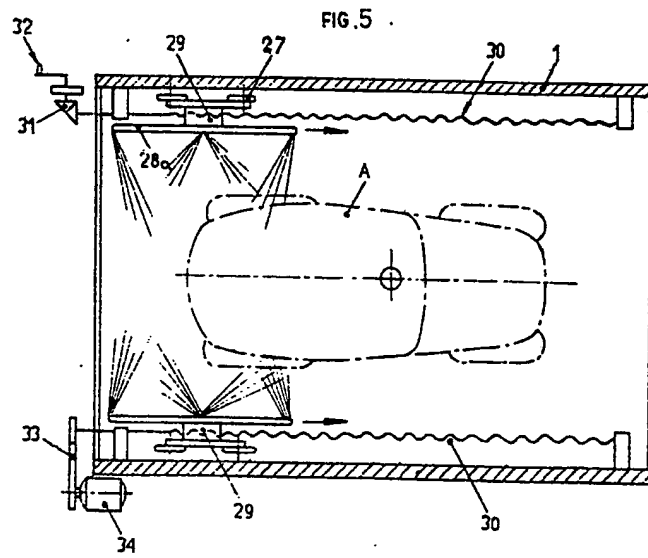
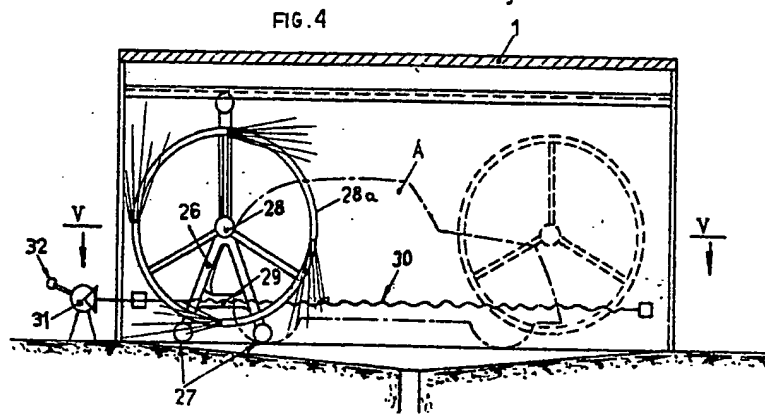
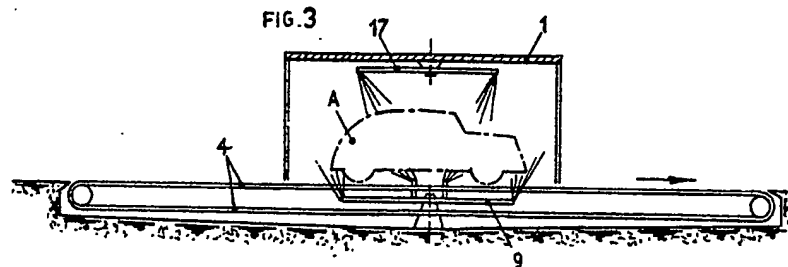
8. Motor vehicle washing plant as claimed in Claim 7, wherein a rotating spray nozzle is arranged in a horizontal plane underneath the vehicle, in the space confined by the vehicle wheels, and is carried by a tough metal tube which is bent to form an elbow and is connected to the movable tunnel, the rotating spray nozzle being guided by means of wheels movable in a longitudinal guide.

9. A modification of the motor vehicle washing plant claimed in Claim 1, wherein the tunnel is replaced by two side walls carrying the rotating nozzles adapted to prevent water sprays outside the plant.

10. Motor vehicle washing plant substantially as described with reference to Figures 1 to 3, or 4 and 5, or 6, 7 and 8 of the accompanying drawings.

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3 SHEETS

This drawing is a reproduction of the Original on a reduced scale.

SHEETS 2 & 3

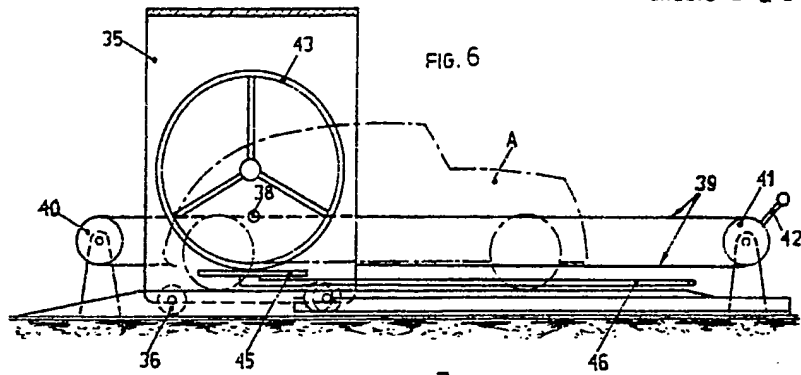


FIG. 6

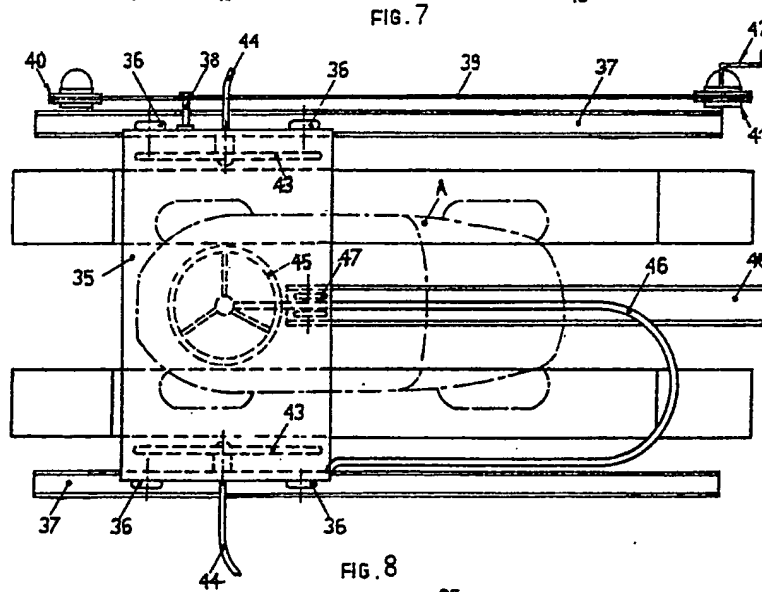


FIG. 7

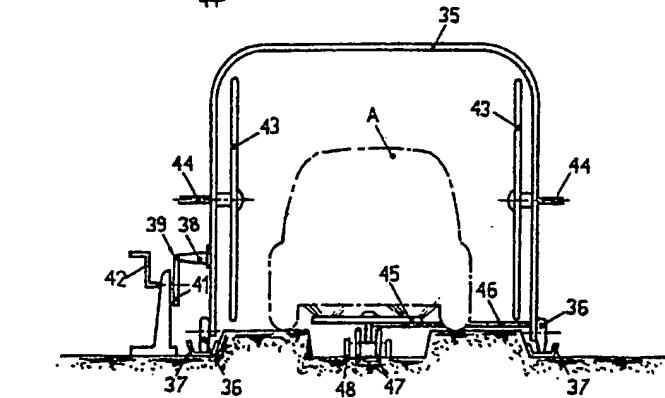


FIG. 8

